Prepared for:
U.S. Agency for International Development
Health Insurance Organization, Egypt

Contract Number:
263-0170-C-00-3042-00

QUALITY ASSURANCE MODULE

FUNCTIONAL AND DETAILED DESIGN

Deliverables 5 and 6

USAID Project Number: 263-0170
[Develop a Detailed and Updated Management Information System for the Egyptian Health Insurance Organization, Cost Recovery Program]

Prepared by:
The MAXIMUS, Chemonics, Arabsoft Project Team

Date:
June 4, 1996

June 4, 1996

Dr. Nabil El Mehairy
Chairman
Health Insurance Organization
Heliopolis
Cairo, Egypt

Dear Dr. El Mehairy:

MAXIMUS is pleased to submit the functional and detailed designs for the Quality Assurance Module of the Health Insurance Organization (HIO) management information system (MIS). These designs were developed based on consultation with numerous individuals from both HIO and contract staff.

The Quality Assurance Module is a reporting system designed to stimulate actions concentrated on increasing treatment quality and decreasing costs. The module's reports will highlight and focus on situations or cases warranting management's attention and quality improvement. The module operates at all levels — Headquarters, branch, and facility — and will assist the HIO in its efforts to adapt common practice protocols. Currently, the HIO does not have full quality assurance programs in place within its facilities. This module, then, is intended to act as a catalyst for and supplement to an ongoing quality assurance program. Please note that this module is not a quality assurance program in and of itself. Furthermore, the implementation plan for this module does not include the resources to develop full quality assurance programs within the HIO. Therefore, we recommend that the HIO take on, concurrent to the implementation of this module, the introduction of quality assurance programs, including medical case review, within HIO facilities.

We ask that you review this document 1) to verify that the design reflects what was discussed during consultation with your staff, and 2) to validate that the reports produced by the module will contribute to HIO's quality improvement efforts. Please pay close attention to Section 3, General Assumptions. The module's success depends on these assumptions being true, or the HIO's ability to accomplish them. Also, please note any organizational, policy, or procedural changes which may be necessary for the success of the module.

We look forward to your comments and suggestions. If you have any questions about this functional design document, please do not hesitate to contact me.

Sincerely,

Leslie Graham
Chief of Party

cc: Mr. Carl Abdou Rahmaan
General Faisal Taie, HIO

June 4, 1996

Mr. Carl Abdou Rahmaan
Project Officer
USAID/Egypt
106 Kasr El Aini Street, 7th Floor
Cairo Center Building
Cairo, Egypt

Ref: Project Number 263-0170-C-00-3042-00

Dear Mr. Abdou Rahmaan:

MAXIMUS is pleased to submit the functional and detailed designs for the Quality Assurance Module of the Health Insurance Organization (HIO) management information system (MIS). These designs were developed based on consultation with numerous individuals from both HIO and contract staff. This document represents Deliverables 5 and 6 for this module.

The Quality Assurance Module is a reporting system designed to stimulate actions concentrated on increasing treatment quality and decreasing costs. The module's reports will highlight and focus on situations or cases warranting management's attention and quality improvement. The module operates at all levels — Headquarters, branch, and facility — and will assist the HIO in its efforts to adapt common practice protocols. Currently, the HIO does not have full quality assurance programs in place within its facilities. This module, then, is intended to act as a catalyst for and supplement to an ongoing quality assurance program. Please note that this module is not a quality assurance program in and of itself. Furthermore, the implementation plan for this module does not include the resources to develop full quality assurance programs within the HIO. Therefore, we recommend that the HIO take on, concurrent to the implementation of this module, the introduction of quality assurance programs, including medical case review, within HIO facilities.

We welcome a discussion of any questions or concerns you may have regarding this document. To avoid expending additional level of effort reworking the designs, we request you provide any comments within four weeks of our submission of this document. If you have any questions, please do not hesitate to contact me.

Sincerely,

Leslie Graham
Chief of Party

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LIST OF EXHIBITS

SECTION 1

INTRODUCTION

1 INTRODUCTION

This document presents the functional and detailed designs of the Quality Assurance (QA) Module. The QA Module will be implemented, along with the Health Insurance Organization (HIO) Management Information System (MIS), at HIO Headquarters, the HIO MIS Center, branches, and facilities. The implementation details of this system's functions may differ from one site type to the other, but the core elements are the same at all levels. This document presents a global view of all quality assurance functions as they will appear at the different levels of implementation. This system is being developed as part of the HIO MIS under the umbrella of the HIO and the U.S. Agency for International Development (USAID).

1.1 Purpose of the Document

This design document is intended to describe the main functions performed by the QA Module in a global view. This document also intends to serve as a baseline for review, comments, and change before the design is implemented and coding of the system begins.

At a high level, this document describes:

- what the QA Module is;
- why the QA Module is needed;
- who, organizationally, will use the system;
- what functions the system will provide for those users;
- what organizational changes must be implemented along with the system for it to be effective; and
- any assumptions and minimum requirements upon which the design is based.

At the detailed level, this design presents the menus, screens, and report layouts of the module. These should be reviewed to validate they meet user needs.

1.2 Process Used to Develop this Design

The QA Module requirements portrayed in this document were created after gathering the input of many people, each with a different expertise, currently working on the Cost Recovery For Health HIO MIS Project. Appendix D is a list of individuals interviewed as part of the analysis for this module. The input for this design comes from members of the MAXIMUS contractor team, drawing on their experience with other systems, knowledge of

needs of the HIO management structure, and their first-hand working experience with HIO managers — the final users of this system.

Since this system does not currently exist in any formal means (paper or software) within the HIO, each person who was interviewed provided his or her expertise regarding functions that the system should perform. This document presents a picture of how the system would look after integrating its parts. Modifications and enhancements to the system are expected as the design is further defined and additional needs come to light.

1.3 Intended Audience

This document presents a high-level, but technical, specification of the discussions held thus far. It introduces the system as perceived by contributing project staff to the other parties involved in contributing to the overall functionality of the QA Module.

It is expected that the audience for this document consists of the people who contributed to its development, as well as the managers of the HIO MIS Project and the HIO. This document should be reviewed:

- to verify that the functions mentioned meet the requirements of the intent of the system;
- to agree that the assumptions used are valid;
- to understand what minimum requirements have to be met to ensure the success of the system; and
- to commit to the organizational changes outlined.

In addition, project management should read this document to ensure that this system is of benefit to both the project and the ongoing activities of the Health Insurance Organization. Additionally, the document should be reviewed to ensure that the system described is consistent with and will contribute to the long-term objectives of the HIO reorganization/reengineering effort.

SECTION 2

GENERAL OVERVIEW OF THIS MODULE

2 GENERAL OVERVIEW OF THIS MODULE

The development of a management information system for use by the Health Insurance Organization is a large undertaking, of which the Quality Assurance (QA) Module is one piece. Exhibit 2-1 is a logframe summary of project activities. Exhibit 2-2 is a logframe summary of the QA Module.

This section provides a high-level overview of the modules to be included in the HIO MIS and the interaction between those modules. This section presents a high-level view only. A technical design description of the QA Module is provided in Section 4.

2.1 Overview of the HIO MIS

The HIO MIS is being developed in phases. Software applicable to management is being developed in the third phase.

The modules in the third phase are:

- Management, and
- Quality Assurance.

Neither of these modules stands alone. Each uses information provided by other modules including those developed in phases one and two. The purpose of these modules is to provide management and quality assurance information about the HIO. With this improved level of information, HIO management can make well-informed and timely decisions regarding cost containment and service provision; a decision-making capacity that is essential as the organization continues to grow and evolve.

All applications for a polyclinic, hospital, or pharmacy reside on the computer at that facility. Therefore, within a facility all applications have access to the database on that facility's machine. For example, the Adverse Incidents Report accesses data already entered through the Patient Records Module and does not need to be reentered.

Data sharing is transparent to the user. The MIS applications are designed to share data and the user needs to do nothing to have this happen. However, the fact that all data are shareable between applications does not mean that the database is open to all. Individuals and operational areas without need to access certain data are not given the opportunity to do so. Exhibit 2-3 depicts data being shared among applications.

Exhibit 2-1 (page 1 of 2)
LOGICAL FRAMEWORK
OVERALL PROJECT

PROJECT NARRATIVE	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Project Goal Improve HIO ability to raise treatment quality & contain costs.	**End of Project Status** Lower costs for drugs per patient. Shorter lengths of stay in hospitals. Reduced number of patient visits per episode of illness. Lower cost of treatment per patient. Higher proportion of favorable outcomes per patient.	Statistical data from HIO. Statistical data from MIS.	HIO supports a MIS. HIO involved in MIS design. HIO provides resources. HIO adopts policies & procedures to maximize use of system.
Project Purpose Build & implement a MIS throughout the HIO.	**Measures of Achievement** Number of HIO sites automated & using MIS. Number of S/W application modules running.	Site visits. End of Project status evaluation.	HIO managers involved in system implementation.
Outputs MIS systems in use in facilities. System generated reports. Trained HIO staff.	**Magnitude of Outputs** 75+ systems installed in Egypt. Hardcopy and electronic reports to targeted users. 1000+ staff trained.	Site visits. Project reports. End of Project status evaluation.	Staff available for training. Enough qualified staff found for each job. HIO purchases needed equipment & supplies. HIO obtains telecom. lines.

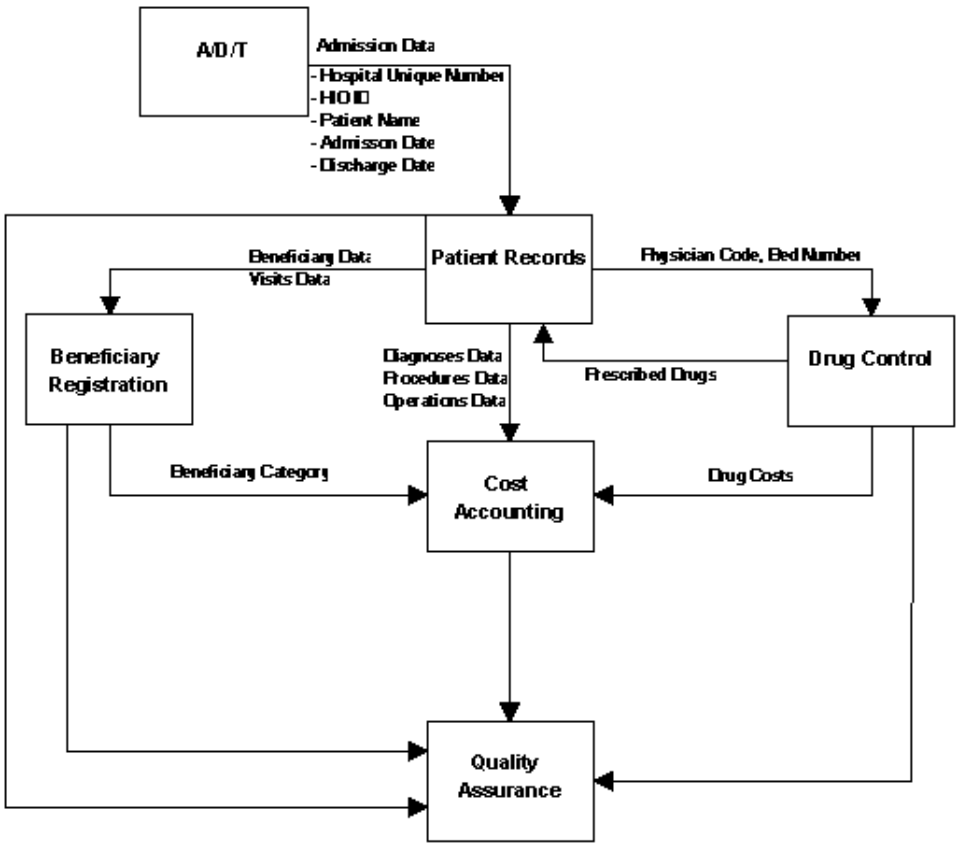
Exhibit 2-1 (page 2 of 2)
LOGICAL FRAMEWORK
OVERALL PROJECT

PROJECT NARRATIVE	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Inputs	**Magnitude of Inputs**		
USAID funding - Training - Technical assistance - Commodities	$21M+	Financial records.	MIS remains a priority of the HIO. Resource support from HIO continues.
HIO Project Resources - Vehicles - Office space - Furniture - Electronic power - Telecom. lines - Computer supplies - Data and Data Conversion personnel	4 project vehicles. Al Ahram Building. Furnish each clinic computer room. 250 KV transformer. Computer supplies continuously available. Data exchange protocols. Data tapes from SIO & PIO.	Status reports. End of project evaluation. Site visits. Monthly data tapes.	SIO & PIO work with HIO to provide regular database updates tapes.
HIO Regular Resources - Facilities - Clinical - Administrative	8 Computer centers. Medical practice committee. Drug formulary committee. Management analysis office. Computer supplies budget. Telecom. cost budget. Hardware maintenance budget.		

Exhibit 2-2
LOGICAL FRAMEWORK
QUALITY ASSURANCE MODULE

PROJECT NARRATIVE	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Module Goal Improve HIO healthcare quality through access to data.	**End of Project Status** Provide accurate statistics on HIO service provision. Generate reports and statistics.	Quality assurance reports.	HIO uses module data. HIO adopts policies and procedures to maximize use of system and ensures accuracy of data input.
Module Purpose Provide HIO management with the information required to make informed quality assurance decisions and perform comparative analysis between like facilities.	**Measures of Achievement** Number of HIO managers using the quality assurance module reports.	Site visits. End of Project Status Evaluation.	HIO managers involved in system implementation.
Outputs Quality assurance information used by HIO managers. System generated reports. Trained HIO management staff.	**Magnitude of Outputs** All clinic, hospital, branch, and headquarters managers using the modules. Electronic, hardcopy, and graphical reports.	Site visits. Project reports. End of Project Status Evaluation.	Managers available for training. Supplies will be available for hard copy reports.
Inputs HIO decision-making resources.	**Magnitude of Inputs** Clinic, hospital, branch, headquarters managers.	Status reports. End of Project Status Evaluation. Site visits.	Resource support from HIO continues.

Exhibit 2-3
INTERFACES BETWEEN SYSTEMS



2.2 Overview of the Quality Assurance Module

The Quality Assurance (QA) Module is designed to exploit the statistical data available through the operational use of the MIS to stimulate actions concentrated on increasing treatment quality and decreasing costs. The information provided by QA Module reports is intended to focus and support detailed medical record review efforts. Both the manual medical case review activities and the automated statistical reports provided by this module are cornerstones of the quality improvement efforts undertaken by the HIO.

This module will also support the HIO quality assurance efforts to develop clinical pathways and adapt common practice patterns. As appropriate, reports will be tied to a specified 30 codes from the International Classification of Diseases, 9th Revision (ICD-9). These 30 ICD-9 codes account for more than 50% of the discharge diagnoses in HIO hospitals. As the ICD-9 codes associated with the majority of polyclinic visits are determined and clinical pathways are developed, they too will be supported by quality assurance reports. The QA Module will also complement other CRHP quality assurance activities including facility process reviews and patient satisfaction surveys.

As a mechanism to collect, analyze, and forecast data, the QA Module is designed to measure the efficacy of healthcare provided. This module will focus and direct medical case reviews and provide HIO managers with the information necessary to support the clinical decisions required to improve the quality of processes and outcomes at their facilities. The QA Module is a tool that will:

- o provide HIO Headquarters with statistics and graphs to recommend detailed reviews and compliance activities,
- o allow polyclinic and hospital managers to monitor activities at their facilities, and
- o allow branch Quality Assurance Analysts to compare activities and outcomes at facilities within a branch.

The major function of this module is to produce quality assurance reports. These reports are designed so that the focus of the reports are similar regardless of whether they are generated at the facility, branch, or Headquarters: they are all directed at measuring the same activity. This will allow the branch managers to review the same data that his/her facility managers are viewing. Likewise, Headquarters managers will be able to review the same data the branch managers are viewing.

Headquarters reports focus on the highest management level. Concern here is on the overall stability and future of the HIO. Thus, the information requirements must allow for monitoring, evaluating, and then planning for the continuing improvement in the quality of healthcare provided by the HIO. Headquarters reports aggregate data by branch with "drill-down" capabilities to view detailed information as well. They will allow Headquarters managers to review the current status and plan for the future by setting and enforcing policy and guidelines as indicated by information provided on these reports.

Branch reports focus on the next level of detail: management of hospitals, polyclinics, and pharmacies. The branch is responsible for ensuring compliance with the procedures and policies implemented by the HIO Headquarters. Branch-level reports will provide the information needed to determine if procedures are being followed and where additional attention must focus.

Facility reports focus on the finest level of detail: the performance of activities within a hospital or polyclinic. Users of information at this level can monitor and investigate performance on a detailed level as needed. They can also use the exception reports provided to focus case review activities in the quality assurance process.

Reports for this module are purposefully designed to promote consciousness and activity which cultivates and enhances the quality of care provided at the HIO hospitals and polyclinics. All data reported in this module are available as a byproduct of the clinical and administrative activities which are input through regular use of the HIO MIS. No additional data collection and entry will be required for this module as all required data will be input by end users in their daily work on the system. It is for this reason that reports produced by

this module pertain to clinical activities and do not include information pertaining to patient satisfaction or organizational quality activities such as operating theater preparedness and the like.

The following sections describe the three types of reports (comparative performance, trend, and exception) and the three levels (facility, branch, and Headquarters) at which they can be generated.

2.2.1 Report Types

Three types of statistical reports will be available from this module: comparative performance, trend, and exception. All three types of reports will be available at facilities. Comparative performance and trend reports will be available at branches and Headquarters. Specific terminology used in this section is defined as follows:

- **Indicator** is a value presented on the report. This value may be retrieved directly from the tables in the HIO MIS or calculated using a formula coded in the report. For example, the hospital admission rate due to infection after a "successful" polyclinic treatment episode is presented as a value on the Unplanned Outcomes Report. The value is calculated by counting the total number of "successful" treatment episodes and dividing that number by the total number of hospital admissions due to infection after a "successful" polyclinic treatment episode.

- **Aggregation level** defines a specific grouping for which data are calculated. On the quality assurance reports, each aggregation level is represented by a row on the report. The aggregation level is specified when the report is run. For example, a report may be run for the aggregation level of branch where rows on the report present values for all facilities in the branch, or for the aggregation level of ICD-9 categories where rows on the report present values for each ICD-9 category.

- **Subset** is the group of records against which a report is run. Records where the specified subset criteria are not met are not included on the report. Only one subset may be specified when the report is run. For example, the report may be run for a specific hospital or a specific ICD-9 category.

Some logical constraints exist for the selection of the aggregation level and subset for a report. For example, if the aggregation level specified is facility *X*, the subset specified may not be all facilities. In addition, a branch may not be selected on facility level reports. As noted in the description of the reports, some aggregation levels and/or subsets are not appropriate or available for a report. Exhibit 2-4 is a matrix presenting these constraints.

Exhibit 2-4 (page 1 of 2)
MATRIX OF CONSTRAINTS FOR SELECTING AGGREGATION LEVELS AND SUBSETS

		Subsets							
		One ICD-9 Code*	All ICD-9 Codes*	One ICD-9 Category**	All ICD-9 Categories**	One Facility	All Facilities	One Branch	All Branches
Aggregation Levels	One ICD-9 Code*					F, B, HQ	B, HQ	B, HQ	HQ
	All ICD-9 Codes*					F, B, HQ	B, HQ	B, HQ	HQ
	One ICD-9 Category**					F, B, HQ	B, HQ	B, HQ	HQ
	All ICD-9 Categories**					F, B, HQ	B, HQ	B, HQ	HQ
	One Facility	F, B, HQ	F, B, HQ	F, B, HQ	F, B, HQ				
	All Facilities	B, HQ	B, HQ	B, HQ	B, HQ				
	One Branch	B, HQ	B, HQ	B, HQ	B, HQ				
	All Branches	HQ	HQ	HQ	HQ				

F=Facility level reports only
B=Branch level reports only
HQ=Headquarters level reports only

Notes:

* Selected ICD-9 codes are those targeted by the HIO for clinical pathways development. For hospitals these codes are:

- Ill-defined Intestinal Infections (009)
- Viral Hepatitis (070)
- Diabetes Mellitus (250)
- Hereditary Hemolytic Anemias (282)
- Schizophrenic Psychoses (295)
- Cataract (366)
- Essential Hypertension (401)
- Acute Myocardial Infarction (410)
- Hemorrhoids (455)
- Acute Upper Respiratory Infections of Multiple or Unspecified Sites (465)
- Acute Bronchitis and Bronchiolitis (466)
- Chronic Disease of Tonsils and Adenoids (474)
- Bronchopneumonia, Organism Unspecified (485)
- Asthma (493)
- Inguinal Hernia (550)
- Other Noninfective Gastroenteritis and Colitis (558)

- Anal Fissure and Fistula (565)
- Cholelithiasis (574)

Exhibit 2-4 (page 2 of 2)
MATRIX OF CONSTRAINTS FOR SELECTING AGGREGATION LEVELS AND SUBSETS

- o Chronic Renal Failure (585)
- o Calculus of Kidney and Ureter (592)
- o Disorders of Menstruation and Other Abnormal Bleeding from Female Genital Tract (626)
- o Infertility, Female (628)
- o Spontaneous Abortion (634)
- o Hemorrhage in Early Pregnancy (640)
- o Excessive Vomiting in Pregnancy (643)
- o Delivery in a Completely Normal Case (650)
- o Other Complications of Labor and Delivery (669)
- o Disorders Relating to Short Gestation and Unspecified Low Birth Weight (765)
- o General Symptoms (Coma and Stupor) (780)

As outpatient (polyclinic) codes are specified they will be included as well.

** These categories represent the ICD-9 categories as outlined in the ICD-9 Clinical Modification, Version 4, 1993.

- o Infectious and Parasitic Diseases (001-139)
- o Neoplasms (140-239)
- o Endocrine, Nutritional, Metabolic, Immunity Disorders (240-279)
- o Diseases of the Blood and Blood Forming Organs (280-189)
- o Mental Disorders (290-319)
- o Diseases of the Nervous System and Sense Organs (320-389)
- o Diseases of the Circulatory System (390-459)
- o Diseases of the Respiratory System (460-519)
- o Diseases of the Digestive System (520-579)
- o Diseases of the Genitourinary System (580-629)
- o Complications of Pregnancy, Childbirth, and the Puerperium (630-676)
- o Diseases of the Skin and Subcutaneous Tissue (680-709)
- o Diseases of the Musculoskeletal System and Connective Tissue (710-739)
- o Congenital Abnormalities (740-759)
- o Certain Conditions Originating in the Perinatal Period (760-779)
- o Symptom, Signs, and Ill-defined Conditions (780-799)
- o Injury and Poisoning (800-999)

2.2.1.1 Comparative Performance Reports

Comparative performance reports present data summarized at an aggregate level with a subset specified at run time. This is the default format for monthly quality assurance reports. These reports may be used to compare targeted ICD-9 codes, disease (ICD-9) categories, facilities, or branches. For example, management might first review the length-of-stay (LOS) values for ICD-9 codes to determine which diagnoses require more detailed review.

> **Note:** Rates are presented on comparative performance reports to normalize raw data. For example, the Unexpected Outcomes Report presents the death rate as opposed to raw data. Otherwise, a hospital *X* where 20 patients out of 100 patients died would be compared equally with hospital *Y* where 20 of 1,000 patients die. Hospital *X* has a death rate of 20% whereas hospital *Y* has a death rate of 2%, significantly lower.

Bar graphs, either stacked or clustered, indicate comparisons and are associated with comparative performance reports. The report format and its associated graphs are presented in Exhibit 2-5.

2.2.1.2 Trend Reports

Trend reports present the monthly rates for the indicators for a rolling 12-month period. Here again, rates are used rather than raw numbers to normalize the data. These reports allow management to analyze how the data changes over a 12-month period. For example, management might want to review the LOS values for asthma over a 12-month period to determine how a change in the common practice pattern affects the LOS.

Line graphs are usually associated with trend reports. Line graphs show a monthly indicator value for a 12-month period. The report format and its associated graph are presented in Exhibit 2-6.

Exhibit 2-5
COMPARATIVE PERFORMANCE REPORT

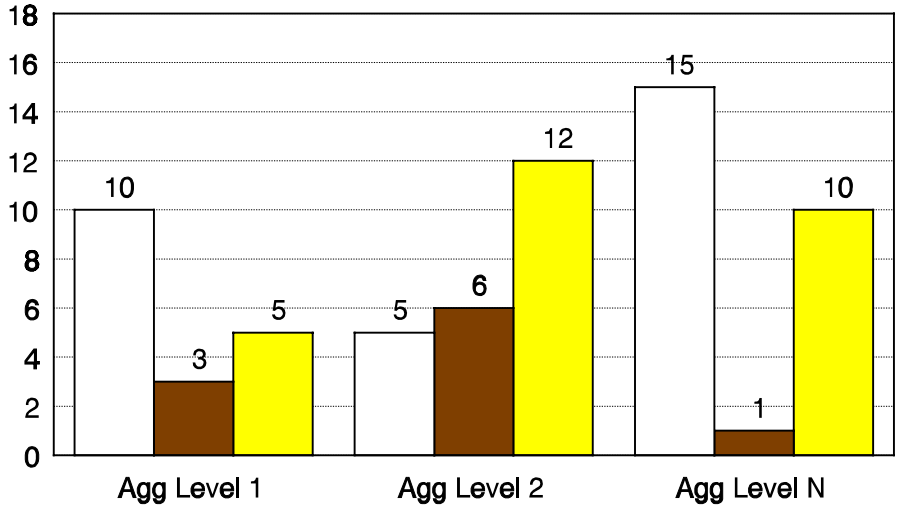
Report Format

Subset

Reporting Period: Run Date:

	Value 1	Value 2	Value N	Unknown	Total	Average
Agg Level 1						
Agg Level 2						
Agg Level N						

Clustered Bar Graph Format



Stacked Bar Graph Format

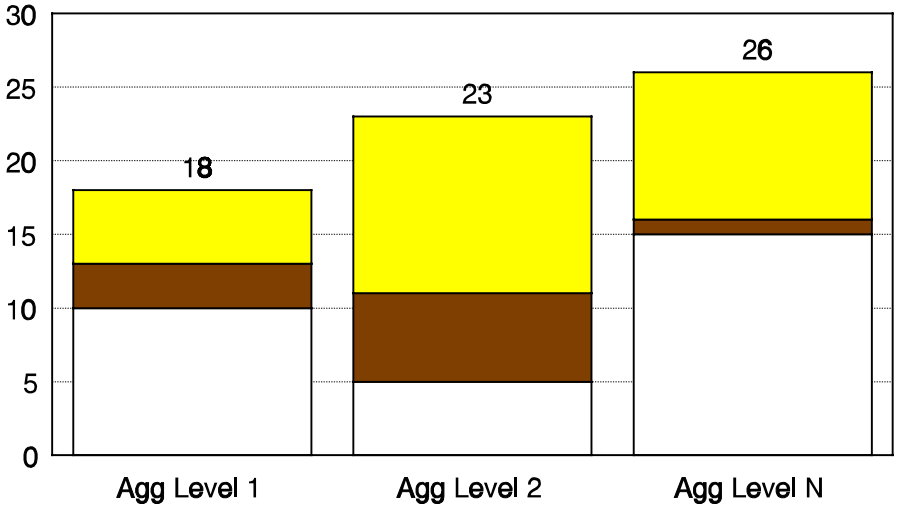


Exhibit 2-6
TREND REPORT

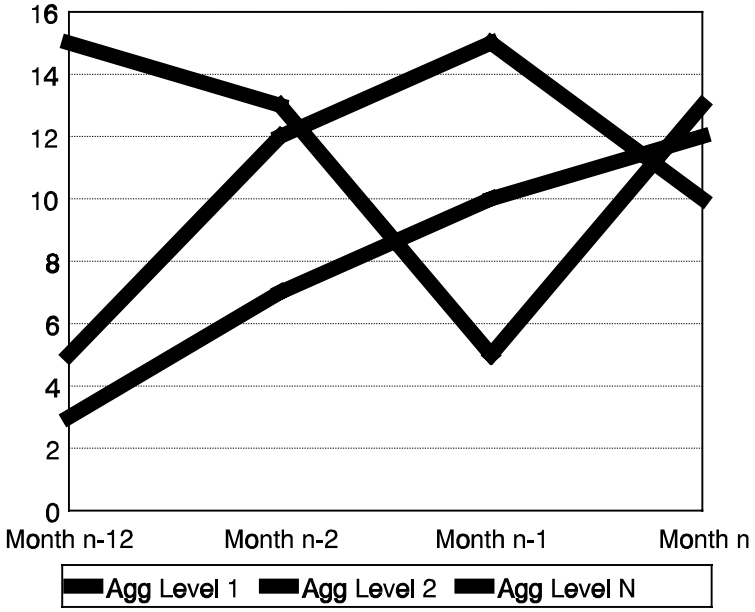
Report Format

Subset

Run Date:

	Current Month (n)	Month n-1	Month n-2	Month n-12	12-Month Total	12-month Average
Agg Level 1						
Agg Level 2						
Agg Level N						

Graph Format



2.2.1.3 Exception Reports

Exception reports present the names of three cases which meet the exception criteria appropriate to the particular report as well as the count for the total population upon which this selection is based. These cases will be selected at random from the total population of cases meeting the exception criteria. The exception conditions for the reports are outlined in the detailed description of each report in Section 4.

> **Note:** Exception reports are generated at facilities only and are used to present a sampling of cases recommended for case review. While the default for the exception report is to list only three cases meeting the exception criteria, a report listing the entire exception population can be printed if a thorough and in-depth review is required.

No graphs are associated with exception reports. The report format is presented in Exhibit 2-7.

Exhibit 2-7
EXCEPTION REPORT

Facility Name

Reporting Period: Run Date:

Case ID	Beneficiary Name	Value	Total Population
Case ID 1	Beneficiary 1		
Case ID 2	Beneficiary 2		
Case ID N	Beneficiary N		
Count			

2.2.2 Report Levels

Each level — facility, branch, and Headquarters — will be able to generate the comparative performance and trend reports. Exception reports will be available only at the facility level. By default, reports produced at Headquarters will be an aggregate of data from all branches. Similarly, reports produced at a branch will be an aggregate of data from the facilities associated with that branch. This will allow managers to review the same type of data, only for different aggregates, at the same time.

2.2.2.1 Facility

Facility-level reports will be generated by facility Quality Assurance Analysts. These reports (besides exception reports) will also be available at branch and Headquarters Quality Assurance Departments. By default, these reports will present data for the previous month unless otherwise specified at run time. The Polyclinic and Hospital QA Applications will be

accessible through the existing UNIX system. No graphics capabilities will be available at the facilities.

2.2.2.2 Branch

Branch-level reports will be generated by the branch Quality Assurance Department. By default, these reports will present data aggregated by facility for the previous month unless otherwise specified at run time. The Branch Quality Assurance Application will run in a Microsoft Windows environment, allowing for the graphics capabilities presented in Section 2.2.1.

These reports are designed to help branch managers detect a problem in a facility and to stimulate questions of the facility manager regarding the problem. This will promote more interaction between branch managers and facility managers, and will demand that facility managers understand the facility-level reports. At the discretion of a branch manager, branch-level reports and graphs can be distributed to the facilities to promote comparative analysis between facilities.

The branch Quality Assurance Department will also have the ability to generate facility-specific reports and graph the results as presented in Section 2.2.1.

2.2.2.3 Headquarters

Headquarters-level reports will be generated monthly by the Headquarters Quality Assurance Department. By default, these reports will present data aggregated for the previous month unless otherwise specified at run time. The Headquarters Quality Assurance Application will be run in a Microsoft Windows environment, allowing for the graphics capabilities discussed in Section 2.2.1.

These reports are designed to help the Headquarters Integrated Medical Services Director oversee quality assurance in the HIO. The reports will highlight problem areas and guide management in their investigations regarding the problem. This will promote more interaction between the HIO Headquarters management, and branch and facility managers, and will demand that branch and facility managers understand the reports produced at their levels. At the discretion of the HIO Chairman, the Headquarters-level reports and graphs can be distributed to the branches to promote comparative analysis between branches.

Headquarters managers will also have the ability to generate branch- and facility-specific reports and graph the results as presented in Section 2.2.1.

SECTION 3

GENERAL ASSUMPTIONS

3 GENERAL ASSUMPTIONS

This section describes the assumptions — the conditions — required for the Quality Assurance Module to work successfully and efficiently. It is important for reviewers of this document to review this section carefully to determine that the conditions are either already in place, or can be implemented.

3.1 Hardware Assumptions

This design assumes each branch will have a personal computer (PC) on which to run the QA reports and graphs. This PC can be placed in the computer room since quality assurance offices do not yet exist at the branch level. The Headquarters layout is assumed to be a Novell LAN configuration with PCs available for management staff. No special hardware is required at the facilities. Laser printers will be available for report and graphic generation at the branches and Headquarters. The branch PC will have access to data from facility-level reports and the Headquarters LAN will have access to data from branch-level reports.

3.2 Software Assumptions

This design assumes that the data required by this module are derived from existing modules of the HIO MIS. These modules will provide data which will be summarized on reports allowing management to gain an overall picture of the quality of services provided by the HIO departments and functions. At the branch and Headquarters levels, graphics will be provided as the QA Module is to be developed using a graphical user interface (GUI) which will provide a Microsoft Windows-based front-end for the system.

To provide this functionality, branches and Headquarters will access this module using a database management system front-end software package capable of providing a GUI interface to the existing system developed under Oracle. The facilities will access this module through the existing UNIX environment present at the facilities.

Oracle's Developer2000 product will be used to develop the module. This product allows reports to be developed and available in both GUI and non-GUI format. Developer2000 will also allow reports to be augmented with graphs at the branches and Headquarters.

3.3 Training Assumptions

The following training assumptions apply to the Quality Assurance Module:

- Proper training is essential if HIO managers and Quality Assurance Analysts are to understand the quality assurance reports generated by the QA Module.

HIO management must be trained in general management analysis and statistical concepts to learn how to interpret the reports and use the information presented for planning and decision making.

- Quality Assurance Analysts will be trained to use this module to generate the reports.

- HIO facility, branch, and Headquarters management will be trained to request and expect these reports monthly.

- Physicians and other medical providers, both HIO and HIO-contracted, will be trained in the use of International Classification of Diseases, 9th Revision (ICD-9) and the Common Procedure Terminology (CPT) codes developed locally for the HIO.

3.4 Process and Procedural Assumptions

The following process and procedural assumptions apply to the Quality Assurance Module:

- ICD-9 and locally-developed CPT codes are used consistently and accurately by physicians and other medical providers (both HIO and HIO-contracted).

- Service provision data from the phase one and phase two modules will be available and up-to-date at the facilities.

3.5 Staffing Assumptions

The staffing assumptions for the QA Module recommend that individuals specifically trained on statistics and quality assurance issues be assigned to Headquarters, branches, and facilities. The persons will be responsible for analyzing the monthly statistical quality assurance reports; for bringing potential problems to the attention of the HIO Chairman, the Integrated Medical Services Director, and the branch medical managers as appropriate; and for enforcing quality assurance procedures implemented by the HIO.

We recommend that the HIO form a Quality Assurance Department. At Headquarters, this department will be directed by a Quality Assurance Manager, and supported by two Quality Assurance Review Specialists and two Quality Assurance Compliance Specialists.

The Quality Assurance Manager will be responsible for:

- supervising the Quality Assurance Analysts,

- statistically analyzing quality assurance reports,

- bringing potentially problematic areas to the attention of the Medical Services Director,

- monitoring trends and providing appropriate updates to the Director of Integrated Healthcare Operations (Medical Director),

- coordinating with the HIO Legal Advisor and the Inspections Division as necessary and appropriate, and

- ensuring that action is taken to review and correct these problems.

We recommend that two Quality Assurance Review Specialists be assigned to Headquarters. One specialist will focus review efforts on hospitals, the other on facilities. They will report directly to the Quality Assurance Manager and be responsible for:

- coordinating and directing medical case reviews as suggested by quality assurance reports and graph analyses,

- working with branch Quality Assurance Managers to assist in reviews of branch-level quality assurance reports and to focus attention on improving the quality of health care provided, and

- assisting branch Quality Assurance Managers in their reviews of facility-level quality assurance reports.

We recommend that two Quality Assurance Compliance Specialists be assigned to Headquarters. One specialist will focus compliance efforts on hospitals, the other on facilities. The Quality Assurance Compliance Specialists will report directly to the Quality Assurance Manager and be responsible for:

- developing and establishing quality assurance protocols to improve the quality of care,

- implementing these protocols in HIO facilities, and

- assisting branch Quality Assurance Managers in their efforts to ensure compliance with these protocols at HIO facilities.

The actual location of the Headquarters quality assurance staff within the new organizational structure is subject to change and will be further defined during the course of the HIO reorganization/reengineering initiative.

For branches, we recommend the same structure as outlined for the Headquarters Quality Assurance Department. At a branch, a Quality Assurance Manager will supervise two Quality Assurance Review Specialists (one focused on hospitals, the other on facilities) and two Quality Assurance Compliance Specialists (again, one focused on hospitals, the other on facilities).

We also recommend that a Quality Assurance Analyst be assigned to each facility. This person will work with the facility manager to analyze the quality assurance reports generated from this module. The Quality Assurance Analyst will also work with the Medical Records Clerk to ensure that cases targeted for quality assurance investigations are available.

These positions are integral to the success of HIO quality assurance efforts, as it is vitally important that QA reports be closely reviewed and appropriate action taken to correct problems highlighted in reports.

3.6 Medical Record Review Assumptions

The QA Module is intended to support and focus medical record reviews, which are an integral part of the quality assurance process. The exception format for reports generated by this module are expected to guide medical reviewers to a sample of cases that require quality assurance evaluations. At this time, few HIO facilities have a medical records review process in place. This module will not create this process, but does offer automated assistance which makes the process easier. The HIO should look to work being done at Medinat Nasr Hospital and under the CRHP Component One for assistance in creating a medical records review process.

> **Note:** A table must be created in the HIO MIS to track medical record reviews. Columns for this table should be: Flag Date, Flag Report, and Review Date.

3.7 Quality Assurance Reports and Graphs Assumptions

Caution must be taken when reviewing the statistical reports presented in the QA Module. Reported data, if taken only at face value and not examined in its context,, can be deceptive and lead to incorrect assumptions regarding its meaning. This, in turn, could lead to an ineffective or inappropriate response. Several examples are discussed below to illustrate this point. The examples presented are not the only instances to consider but are intended to alert the user to the potential pitfalls of acting on information in reports without analyzing the particulars of a situation as well as the underlying data.

It is important when reviewing data to understand that raw data is not presented. Raw data does not reflect case mix or case severity and therefore can be misinterpreted. For example, the length of stay rates at hospital *X* for birth-associated ICD-9 codes may be higher than at hospital *Y* because hospital *X* handles cases which require special care while hospital *Y* handles routine births. This highlights the fact that using data analysis should not to be viewed alone as an indicator of quality.

Similarly, data presented as a rate should not be considered without calculating the raw data associated with the rate. For example, hospital *X* has a death rate of 20% with the raw supporting data being 20 of 100 cases result in death. In comparison, hospital *Y* has a death rate of 10%, but the data supporting it is that 100 of 1,000 cases result in death. In this

example, the 10% death rate at hospital *Y* has a high actual impact and both hospitals should be investigated for quality of care.

Every attempt will be made to account for these possibilities when designing the reports, but the user must be aware of the pitfalls and use these reports only as a guide for investigation, not as the sole source of information.

When reviewing a graph it is important to pay attention to its scale. It is quite possible that two bars in two graphs look the same, but that the scales used in the two graphs are different (e.g., one graph is calibrated at one unit while the other is calibrated at ten units. All graphs in this module are designed to provide illustrative support to reported data; graphs in themselves do not provide the hard data needed for in-depth analysis. It is for this reason that the module presents graphs only after a report is generated. A user is not able to generate a graph without the supporting report.

Other assumptions exist which affect the analysis of statistical reports and graphs. These assumptions and recommendations will be discussed during the training for users of the quality assurance reports.

3.8 Aggregation and Migration of Data for Production of Quality Assurance Reports Assumptions

The raw, uncalculated data for QA reports are available directly from the clinic and hospital applications of the HIO MIS. These data must be collected and aggregated at each facility to produce the quality assurance reports described in this document. Separate tables for each report will be created to store the data with a row in each table representing the reporting month and year, and the facility combination. Raw data will be stored to facilitate the calculations of rates, modes, and other statistical indicators required by the reports. The module produces three reports:

- the Number of Days Between Admission and First Procedure Report,
- the Unexpected Outcomes Report, and
- the Protocol Adherence Report.

The number of Days Between Admission and First Procedure Report requires a data table with the following fields:

- facility ID,
- reporting month and year,
- ICD-9 category,
- number of cases less than 1 day,

- number of cases 1 day,
- number of cases 2 days,
- number of cases 3 days,
- number of cases 4 days,
- number of cases 5 days,
- number of cases 6 days,
- number of cases more than 6 days,
- number of cases with unknown days, and
- number of deaths without a procedure.

The Unexpected Outcomes Report requires a data table with the following

- facility ID,
- reporting month and year,
- ICD-9 category,
- number of unexpected admissions due to infection,
- number of unexpected readmissions due to infection,
- number of unexpected surgeries due to infection,
- number of unexpected deaths due to infection,
- number of unexpected admissions due to drug or transfusion reactions,
- number of unexpected readmissions due to drug or transfusion reactions,
- number of unexpected surgeries due to drug or transfusion reactions,
- number of unexpected deaths due to drug or transfusion reactions,
- number of unexpected admissions due to other causes,
- number of unexpected readmissions due to other causes,

- number of unexpected surgeries due to other causes, and
- number of unexpected deaths due to other causes.

The Protocol Adherence Report requires a data table with the following fields:

- facility ID,
- reporting month and year,
- ICD-9 code,
- discharge count per ICD-9,
- number of discharges without a recommended CPT code,
- number of cases exceeding the recommended length of stay, and
- number of cases without a recommended CPT code resulting in death.

SECTION 4

FUNCTIONAL DESIGN AND REPORT LAYOUTS

4 FUNCTIONAL DESIGN AND REPORT LAYOUTS

This section describes the functional design of the Quality Assurance (QA) Module. This module consists of three reports and their associated graphs: Number of Days Between Admission and First Medical Procedure, Unexpected Outcomes, and Protocol Adherence. The comparative performance and trend reports described in Section 2.2.1 are available at all levels; the exception report can be run only at the facility level. Some variables may be specified to overwrite defaults at run time. Only reports (with accompanying graphs at the branch and Headquarters level) are available in this module.

This section defines the reports of the QA Module without specifying implementation details. The structures outlined in Section 2 are followed as closely as is practical for the report's subject area. Shaded cells will not be calculated as they are inappropriate for the report. Any required calculations are presented immediately following presentation of the report. If new reports are required in the future, the report formats described in Section 2 will be used. Some specific terminology used in this section is defined in Section 2.2.

The default reporting period for the comparative performance and exception reports is the month previous to the current month. The option to specify a particular month, quarter, or year will be available at run time. The reporting period option is not, however, available for the trend format. A trend format report always presents data aggregated by month for the 12 months preceding the reporting month.

4.1 Number of Days Between Admission and the First Medical Procedure

This report presents information about the number of days between the admission and the first medical procedure performed for patients in a hospital. These data show the length of time between admission of a patient and initial provision of medical care defined as intervention or investigation. This period of time will be referred to as the **first intervention interval**. The death rate for admissions where no record of a procedure is performed will also be presented.

Analysis of these class interval values will provide information on the timeliness of initial medical attention received by patients. The number of days between these milestones directly impacts length of stay and therefore quality of care. It also affects treatment cost for the patient and diagnosis. Reducing both average length of stay and treatment cost are quality assurance goals.

The following assumptions pertain to this report:

- Procedures performed during the admissions process such as recording blood pressure, taking temperature, and the like, are not considered medical treatment.

- The ICD-9 category assignment is based on the ICD-9 code assigned at admissions and categorized as presented in the footnote to Exhibit 2-4.

4.1.1 Number of Days Between Admission and the First Medical Procedure — Comparative Performance Report

The comparative performance format for the Number of Days Between Admission and the First Medical Procedure Report calculates the values of the indicators for the aggregate level specified when the report is run. The following values are presented:

- number of admissions,
- rate of cases with a first intervention interval of one day or less,
- rate of cases with a first intervention interval of two days,
- rate of cases with a first intervention interval of three days,
- rate of cases with a first intervention interval of four days,
- rate of cases with a first intervention interval of five days,
- rate of cases with a first intervention interval of six days,
- rate of cases with a first intervention interval of six days or more,
- rate of cases where the first intervention interval is unknown, and
- rate of cases without a first procedure resulting in death.

This report will allow the HIO to be more aware of the activities associated with receiving a newly-admitted patient. An exception report, described in Section 4.1.3, can be run for a hospital and an in-depth case review can be pursued. Examples of this report and its associated graph are presented in Exhibit 4-1.

Exhibit 4-1 (page 1 of 2)
NUMBER OF DAYS BETWEEN ADMISSION AND THE FIRST MEDICAL PROCEDURE — COMPARATIVE PERFORMANCE REPORT

Report Format

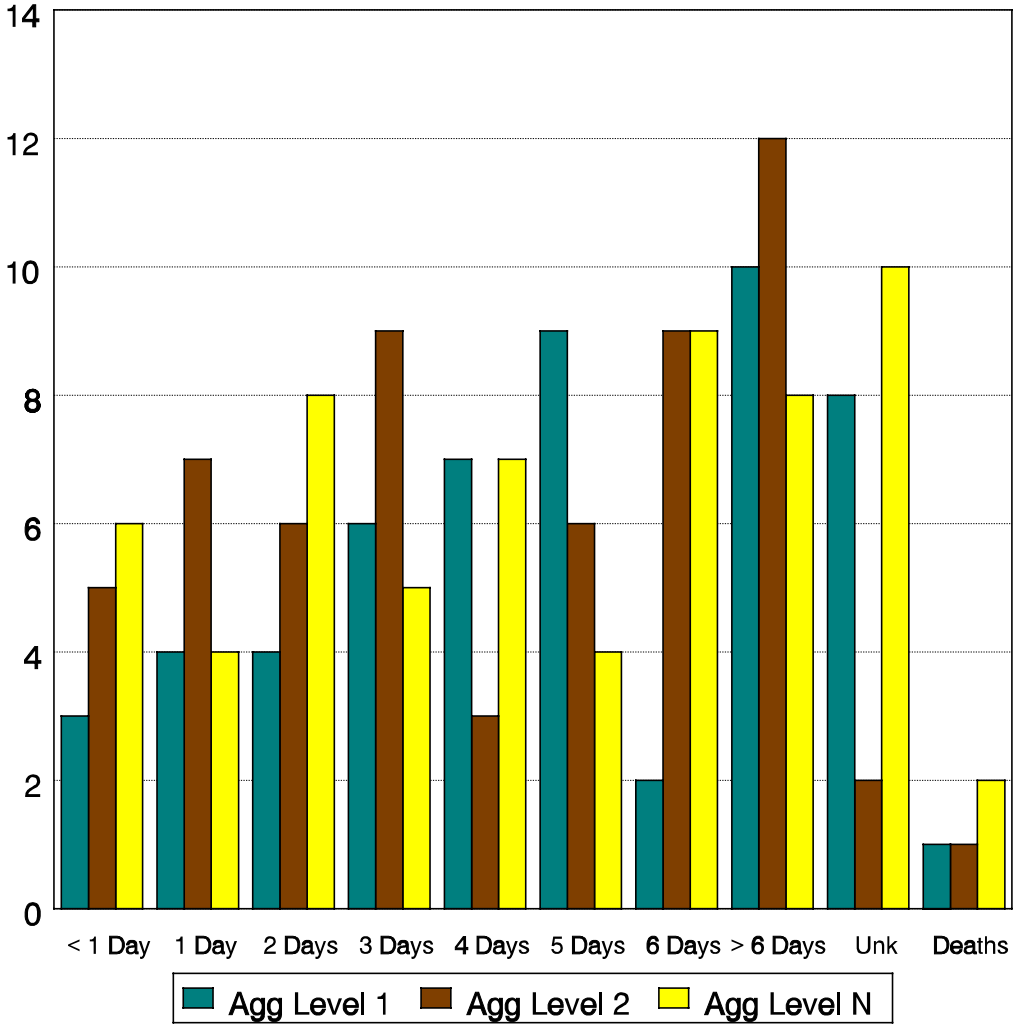
Subset

Reporting Period: Run Date:

	Number of cases admitted	<1 day rate	1 day rate	2 days rate	3 days rate	4 days rate	5 days rate	6 days rate	>6 days rate	Unknown number of days	Deaths without procedure
Agg Level 1											
Agg Level 2											
Agg Level N											
Average											

Exhibit 4-1 (page 2 of 2)
NUMBER OF DAYS BETWEEN ADMISSION AND THE FIRST MEDICAL PROCEDURE — COMPARATIVE PERFORMANCE REPORT

Graph Format



4.1.2 Number of Days Between Admission and the First Medical Procedure — Trend Report

The trend format for the Number of Days Between Admission and the First Medical Procedure Report presents the most frequently occurring interval between admission and first treatment over a given month. This is defined as the mode, the most frequent value for a set of data. In this case the mode is the number of days occurring with the greatest number of cases.

For example, during a given month, 400 patients are admitted to hospital *X*. Of those, 40 wait one day for treatment, 70 wait two days, 190 wait three days, and 100 wait four days. The mode — the most frequently occurring number of days a patient had to wait — is three days. Three is the value that would be reported for hospital *X* during this month.

This report shows the influences of quality assurance procedures or changes introduced over time. By running this report for a specific ICD-9 category or hospital, branch Quality Assurance Analysts can analyze a trend over a rolling 12-month period. Examples of this report and its associated graph are presented in Exhibit 4-2.

4.1.3 Number of Days Between Admission and the First Medical Procedure — Exception Report

This exception report is available only at hospitals. This report presents a random sample list of three cases per ICD-9 category or code, specified at run time, where the first intervention interval is more than six days or unknown, and the outcome is death. The value of the total population for each of these categories will also be presented. An example of the report is presented in Exhibit 4-3.

4.2 Unexpected Outcomes

This report presents rates of unexpected or unplanned outcomes in the 30 days following the conclusion of a “successful” polyclinic episode or hospital visit. Unplanned outcomes include new polyclinic visits or hospital admissions following a successful polyclinic episode, and unplanned readmissions, unplanned surgeries, and unexpected deaths following a successful hospital discharge. Analysis of this information will provide management with the rates of unanticipated healthcare requirements following a successful treatment episode.

Unexpected outcomes can be due to an unresolved or persistent infection, drug/transfusion reaction, or other indicators of poor progression towards recuperation. All may be indicators of poor quality of care as manifested by an unresolved or recurring complaint.

Exhibit 4-2
NUMBER OF DAYS BETWEEN ADMISSION AND THE FIRST MEDICAL PROCEDURE — TREND REPORT

Report Format

Subset

Run Date:

	Current Month (n)	Month (n-1)	Month (n-2)	Month (n-12)
Agg Level 1				
Agg Level 2				
Agg Level N				

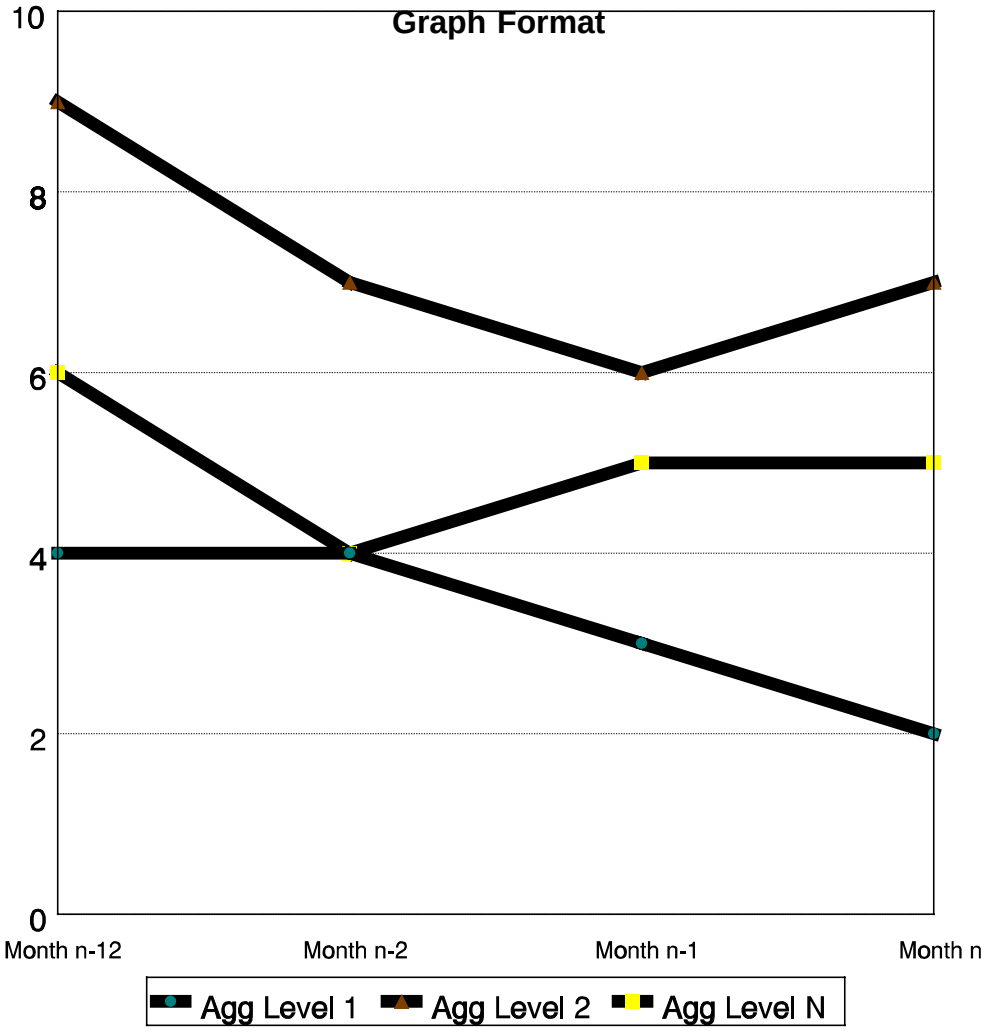


Exhibit 4-3
NUMBER OF DAYS BETWEEN ADMISSION AND THE FIRST MEDICAL PROCEDURE — EXCEPTION REPORT

Hospital Name

Reporting Month: Run Date:

ICD-9 Category	Case ID	Case Name	Cause	Total Population
001-139	Case 1		Highest Number of Days	
	Case 2		Unknown	
	Case 3		Death	
140-239	Case 1		Highest Number of Days	
	Case 2		Unknown	
	Case 3		Death	

This Unexpected Outcomes Report should prompt detailed case reviews and conclusions regarding common factors between cases resulting in an unplanned outcome. For example, branch Quality Assurance Analysts could target review efforts at a hospital with a high readmission rate. If run for a branch, the results presented can be reviewed to determine if one physician or diagnosis accounts for the majority of the readmission cases. In this way, the report guides and focuses additional quality assurance activities pertaining to adverse incidents.

The following assumptions pertain to the Unexpected Outcomes Report:

- The discharge count will be for n-2 (where n is the current month) because this report is based on a 30-day window between the discharge associated with the first episode and an admission associated with the second episode. Therefore, if the report is generated for March 1996, the discharge count will be for January 1996 and the admissions counted will be for 30 days following the discharge date — events occurring in January and February 1996.

- Because a criteria of direct association between care episodes would be too exclusionary, discharge and admission events will be associated if the ICD-9 codes fall into the same categories as outlined in the ICD-9 Clinical Modification, Version 4, 1993 (presented as a footnote to Exhibit 2-1).

4.2.1 Unexpected Outcomes — Comparative Performance Report

This report will present the rates of polyclinic visits or hospital admissions, readmissions, unplanned surgeries, or deaths due to infection, drug/transfusion reaction, or

other indicators of the existence of poor quality of care. Polyclinic reports will reflect all unplanned revisits and hospital admissions. Polyclinic reports will not specify the revisit or

admission reason as no tracking is done on the polyclinic level regarding infections or drug/transfusion reactions.

Hospital reports will reflect readmissions, unplanned surgeries, and deaths due to infection, drug/transfusion reaction, or other reasons. These rates will be presented for the aggregate level and subsets specified.

This report can be used by managers to investigate higher-than-expected rates for revisits, admission, readmission, unplanned surgeries, and death due to poor quality of care for the same ICD-9 category. This review will prompt managers to investigate the procedures used to treat specific diagnosis. Improvement in the quality of care and reduction of costs should result from the institutionalization of common practice patterns at both hospital and facilities. Examples of the report and its associated graphs are presented in Exhibit 4-4.

4.2.2 Unexpected Outcomes — Trend Report

This report will present monthly rates of unexpected outcomes for a selected aggregate level for a rolling 12-month period. Due to the abundance of possible aggregate level and subset combinations, and the physical space required to display the results, this report will be limited to specification of a single aggregate level at run time. It will present the total number of discharges and rates for admission, readmission, unplanned surgery, and death without regard to cause. Possible aggregate levels are specific ICD-9 category, specific facility, or specific branch.

This report can show the influences of quality assurance procedures or changes introduced over time. For example, selecting facility *X* as the aggregate level will present monthly values for the indicators allowing analysts to review the adverse incident trends for a specific facility where quality assurance processes have been implemented. In another example, selecting a specific ICD-9 category for which quality assurance protocols have been introduced recently will allow analysis of the effect of these protocols over time. Examples of this report and its associated graph are presented in Exhibit 4-5.

4.2.3 Unexpected Outcomes — Exception Report

The exception format for the Unexpected Outcomes Report presents three cases, one each representing an unplanned readmission, surgery, and death, per ICD-9 category for each hospital. The polyclinic report will present a list of three cases requiring hospitalization for each ICD-9 category. This will serve to highlight areas that require investigation.

This report provides a list of specific cases to target for investigating unexpected outcomes. An example of this report is presented in Exhibit 4-6.

Exhibit 4-4 (page 1 of 2)
UNEXPECTED OUTCOMES — COMPARATIVE PERFORMANCE REPORT

Report Format

Subset

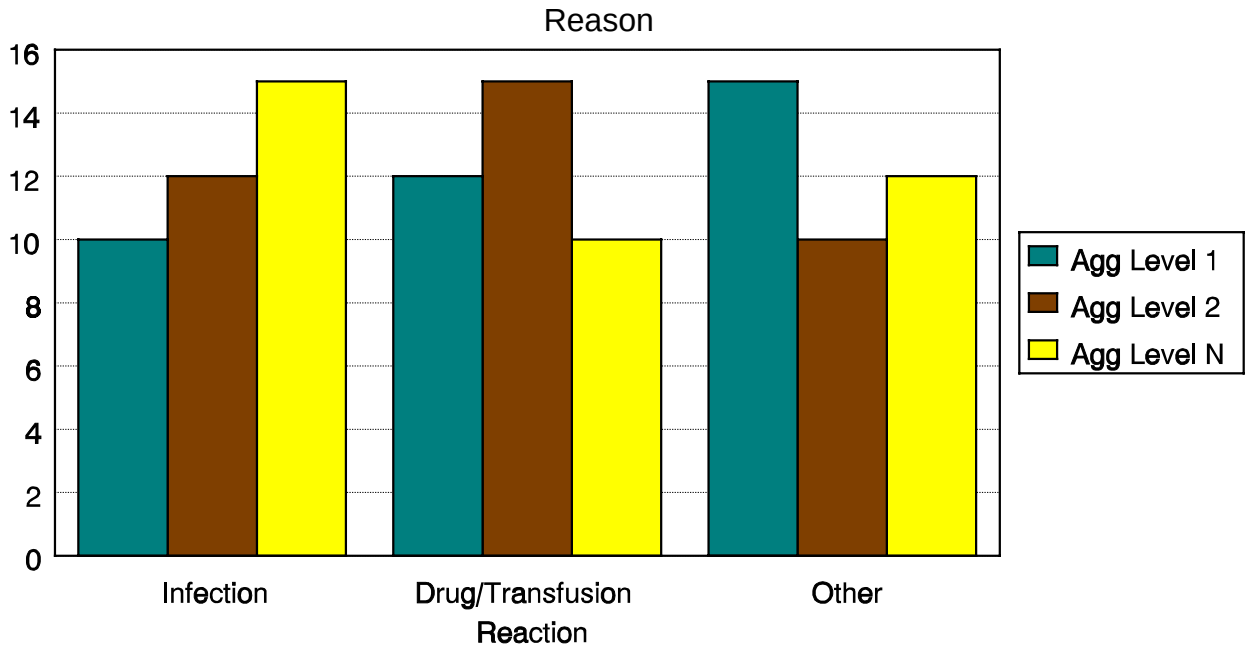
Reporting Period: Run Date:

		Infection (a)					Drug/Transfusion Reaction (a)					Other					
	Total Discharges	Admission	Readmission	Surgery	Death	Total	Admission	Readmission	Surgery	Death	Total	Revisit	Admission	Readmission	Surgery	Death	Total
Agg Level 1												(a)	(a)				
Agg Level 2												(a)	(a)				
Agg Level n												(a)	(a)				
Total												(a)	(a)				

(a) Only data available when generated for a polyclinic.

Exhibit 4-4 (page 2 of 2)
UNEXPECTED OUTCOMES — COMPARATIVE PERFORMANCE REPORT

Clustered Bar Graph Format



Stacked Bar Graph Format

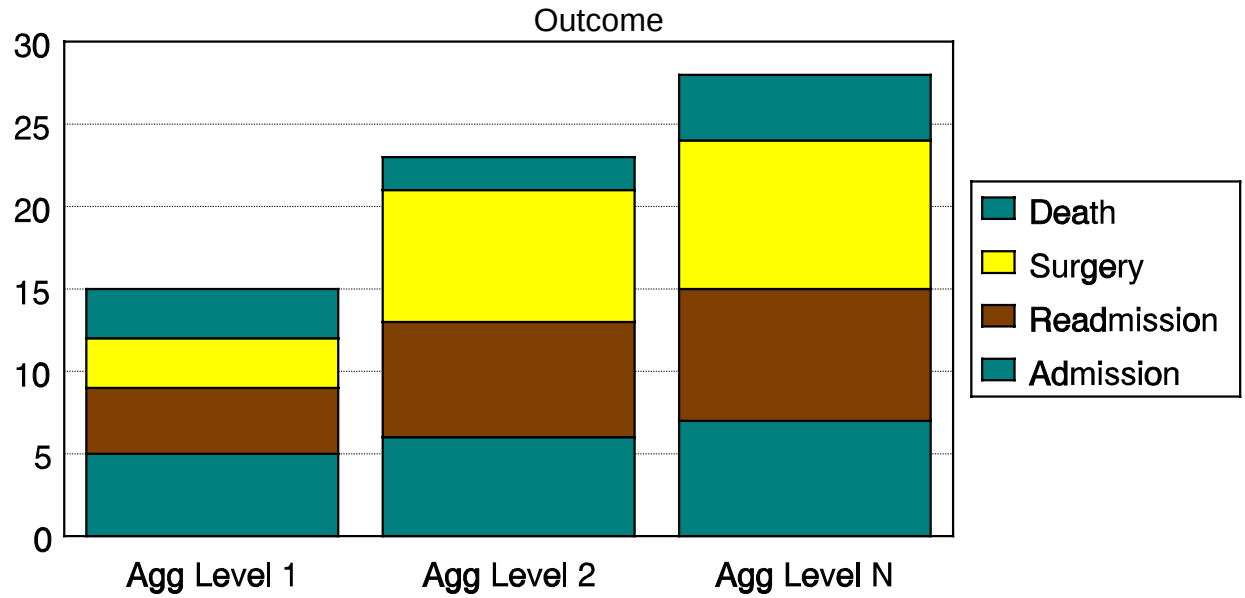


Exhibit 4-5
UNEXPECTED OUTCOMES — TREND REPORT

Report Format
Aggregate Level

Run Date:

	Current Month (n)	Month (n-1)	Month (n-2)	Month (n-12)	Average
Total Discharges					
Admission Rate					
Readmission Rate					
Surgery Rate					
Death Rate					
Total Rate					

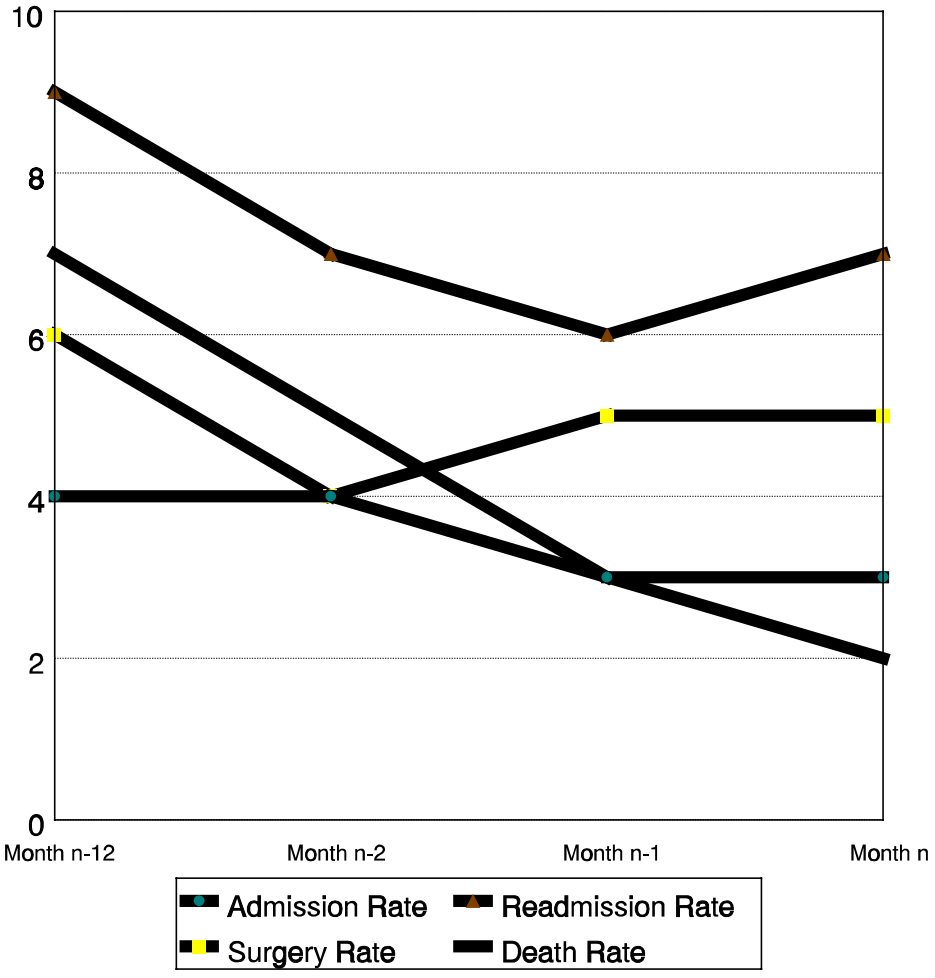


Exhibit 4-6
UNEXPECTED OUTCOMES — EXCEPTION REPORT

Facility Name

Reporting Month: Run Date:

ICD-9 Category	Case ID	Case Name	Outcome	Total Population
001-139	Case 1		Readmission*	
	Case 2		Surgery	
	Case 3		Death	
140-239	Case 1		Readmission*	
	Case 2		Surgery	
	Case 3		Death	

* Polyclinic reports will present two cases representing unplanned polyclinic revisits and two cases representing unplanned hospital admissions.

4.3 Protocol Adherence

This report will support the current HIO efforts to design and implement common practice patterns for 30 of the most common diseases associated with the HIO population. These diseases (identified and targeted by ICD-9 codes) are associated with more than 50% of the discharges from HIO hospitals. When polyclinic ICD-9 codes are targeted by the HIO, polyclinics will be able to generate similar reports. The report presents data pertaining to the inclusion of specific CPT codes in the medical record for an episode for these ICD-9 codes.

Note: The report will not aggregate by ICD-9 categories.

The following assumptions pertain to this report:

- The HIO will adopt and distribute recommended clinical pathways for common treatment protocol for the 30 ICD-9 codes currently targeted for the hospitals. When a similar set of codes is determined for the polyclinics, the HIO will adopt and distribute recommended clinical pathways for these diagnoses as well.

- The HIO will indicate the primary one-to-three CPT codes considered as mandatory treatment procedures for each clinical pathway.

- The HIO will determine an ideal length of stay for each diagnosis in accordance with the adopted clinical pathway and treatment cost effectiveness for that diagnosis.

Analysis of the data presented on the report will provide management with an indication of the effects of adhering to the clinical pathways established for the ICD-9 codes where clinical pathways have been adapted by the HIO.

4.3.1 Protocol Adherence — Comparative Performance Report

This comparative performance format of the Protocol Adherence Report presents the rates of the above-referenced indicators for the aggregate level and subsets specified when the report is run. This report will allow facility managers to monitor the number of cases adhering to the treatment plan as indicated by the number of cases where the recommended CPT codes are noted in the medical record.

The report will present the following indicators for each of the targeted ICD-9 codes:

- hospital discharge count for the 30 ICD-9 codes targeted at hospitals or polyclinic episode count for the ICD-9 codes targeted for polyclinics (when the polyclinic codes have been determined),
- rate of cases where the primary CPT codes in the recommended clinical pathways are listed as CPT codes in the patient's medical record,
- rate of cases where the LOS (hospital reports only) meets or exceeds the recommended LOS, and
- death rate for the targeted ICD-9 codes.

This report can be used by branch Quality Assurance Compliance Specialists to determine if facilities are following the recommended common practice patterns specified for these codes. In addition, a review of cases with both long and short lengths of stay can indicate how the performance of recommended procedures impacts length of stay. Examples of this report and its associated graph are presented in Exhibit 4-7.

4.3.2 Protocol Adherence — Trend Report

This report will present monthly values for the indicators discussed above for a rolling 12-month period. Due to the importance of the data presented in the report and extent to which it supports the HIO efforts to adapt common practice patterns, the trend format of this report is run for an individual ICD-9 code specified at run time. The specification of the facility or branch subset is also available at run time.

This report can show the influences of quality assurance procedures or changes introduced over time. For example, selecting ICD-9 070 (Viral Hepatitis) for all facilities will present monthly values for Viral Hepatitis, allowing analysts to review the protocol adherence at facilities and compare the monthly results over a 12 month period. Examples of this report and its associated graph are presented in Exhibit 4-8.

Exhibit 4-7
PROTOCOL ADHERENCE — COMPARATIVE PERFORMANCE REPORT

Report Format

Subset

Reporting Month: Run Date:

ICD-9 Code	Discharge Count	CPT Presence Rate	Meet or Exceed LOS Rate	Death Rate
ICD-9 #1				
ICD-9 #2				
ICD-9 #30				

Graph Format

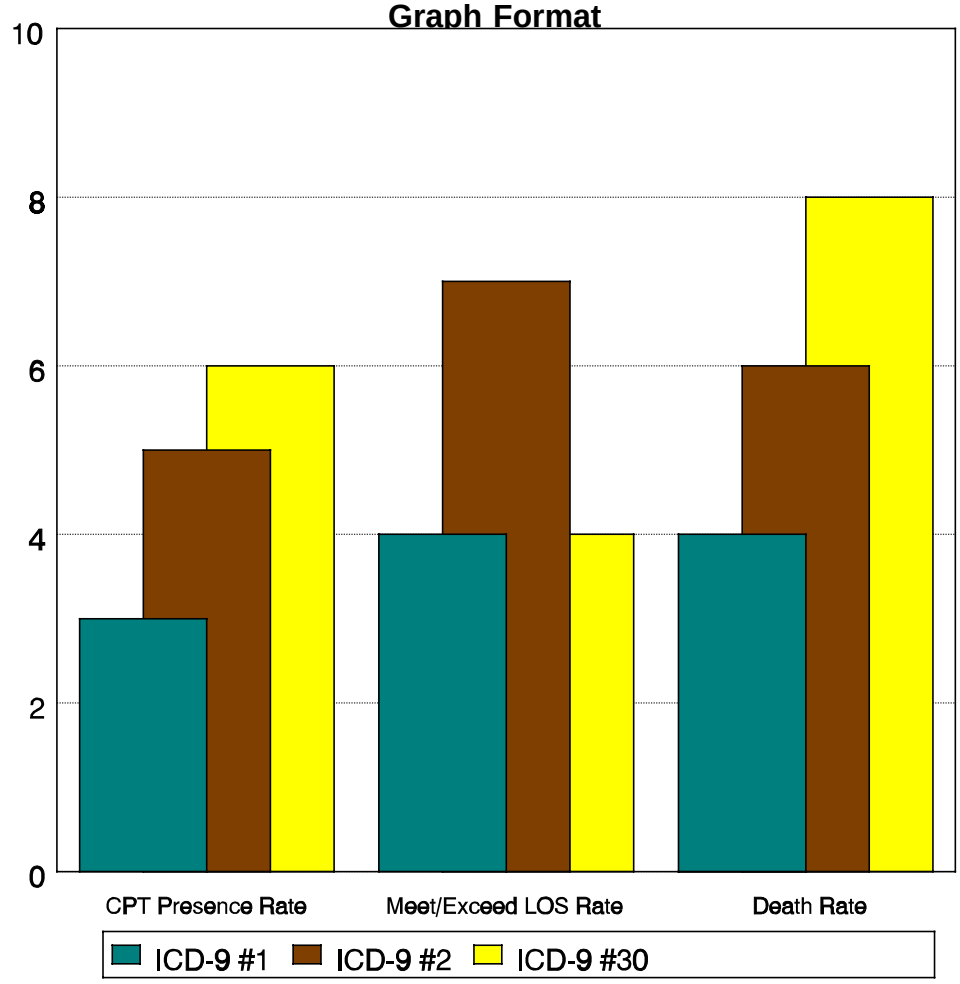


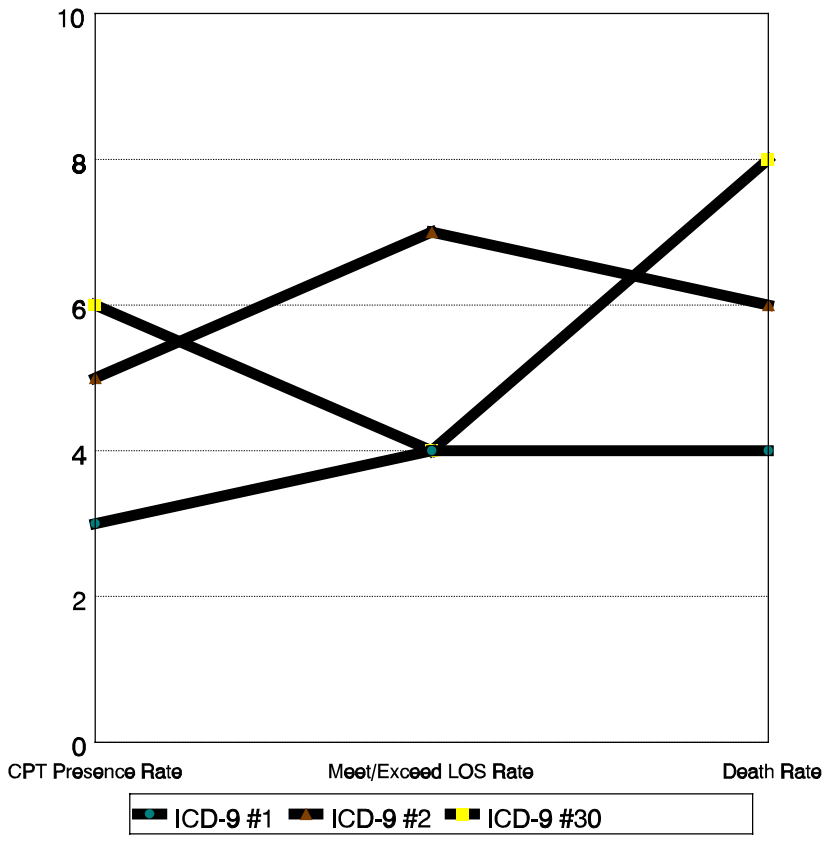
Exhibit 4-8
PROTOCOL ADHERENCE — TREND REPORT

Report Format

ICD-9 Code
Subset

Reporting Period: Run Date:

	Current Month (n)	Month (n-1)	Month (n-2)	Month (n-12)	Total	Average
Discharge Count						
CPT Presence Rate						
Meet or Exceed LOS Rate						
Death Rate						



4.3.3 Protocol Adherence — Exception Report

The exception format of the Protocol Adherence Report presents a list of three cases resulting in death for each ICD-9 code. This will serve to highlight areas that require investigation as the report provides a list of specific cases to target for protocol adherence. An example of this report is presented in Exhibit 4-9.

Exhibit 4-9
PROTOCOL ADHERENCE — EXCEPTION REPORT

Facility Name

Reporting Month: Run Date:

ICD-9 Category	Case ID	Case Name	Total Population
001-139	Case 1		
	Case 2		
	Case 3		
140-239	Case 1		
	Case 2		
	Case 3		

APPENDIX A

GLOSSARY OF ACRONYMS

APPENDIX A: GLOSSARY OF ACRONYMS

CPT: Current Procedural Terminology

CRHP: Cost Recovery for Health Project

DBMS: Database Management System

GUI: Graphical User Interfaces

HIO: Health Insurance Organization

ICD: International Classification of Diseases

LAN: Local Area Network

LOS: Length of Stay

MIS: Management Information System

PC: Personal Computer

QA: Quality Assurance

USAID: United States Agency for International Development

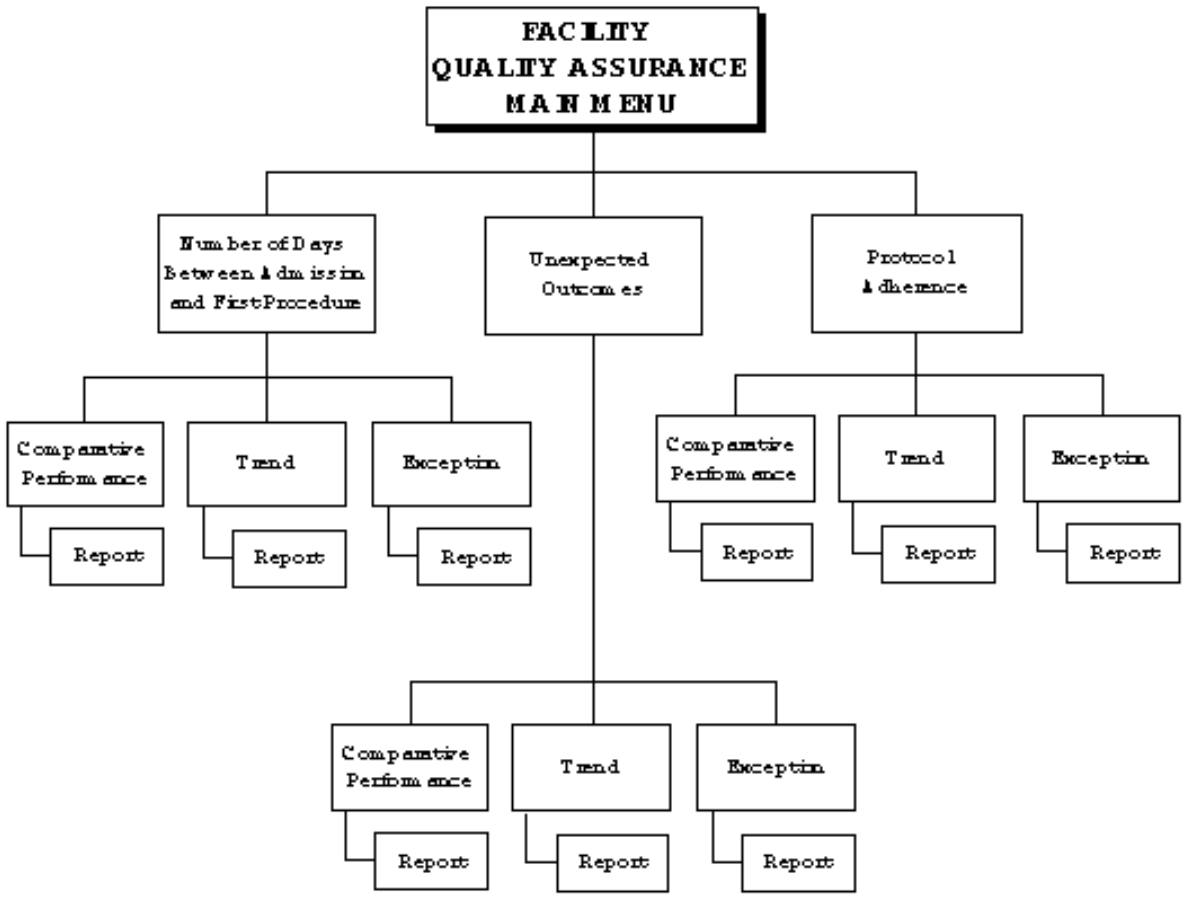
APPENDIX B

SYSTEM MENUS

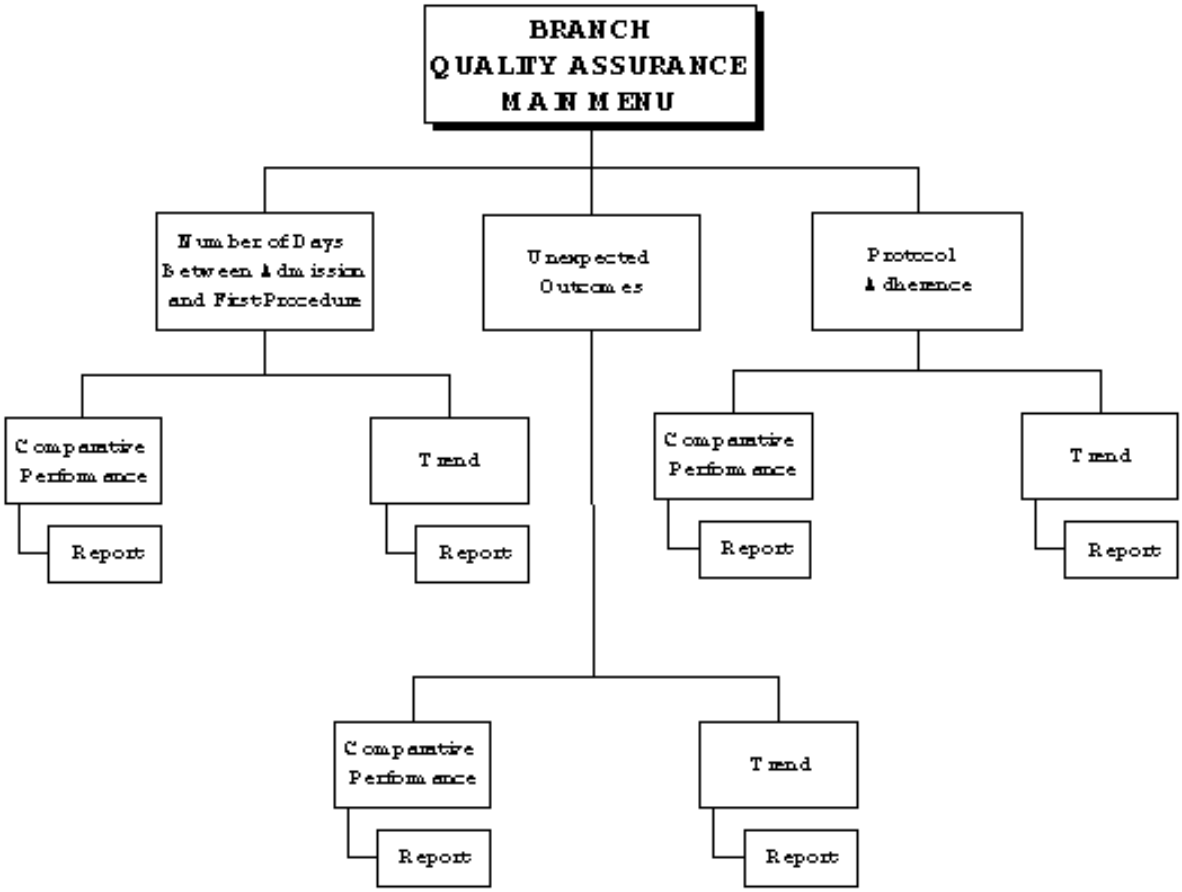
APPENDIX C

FUNCTIONAL DECOMPOSITIONS

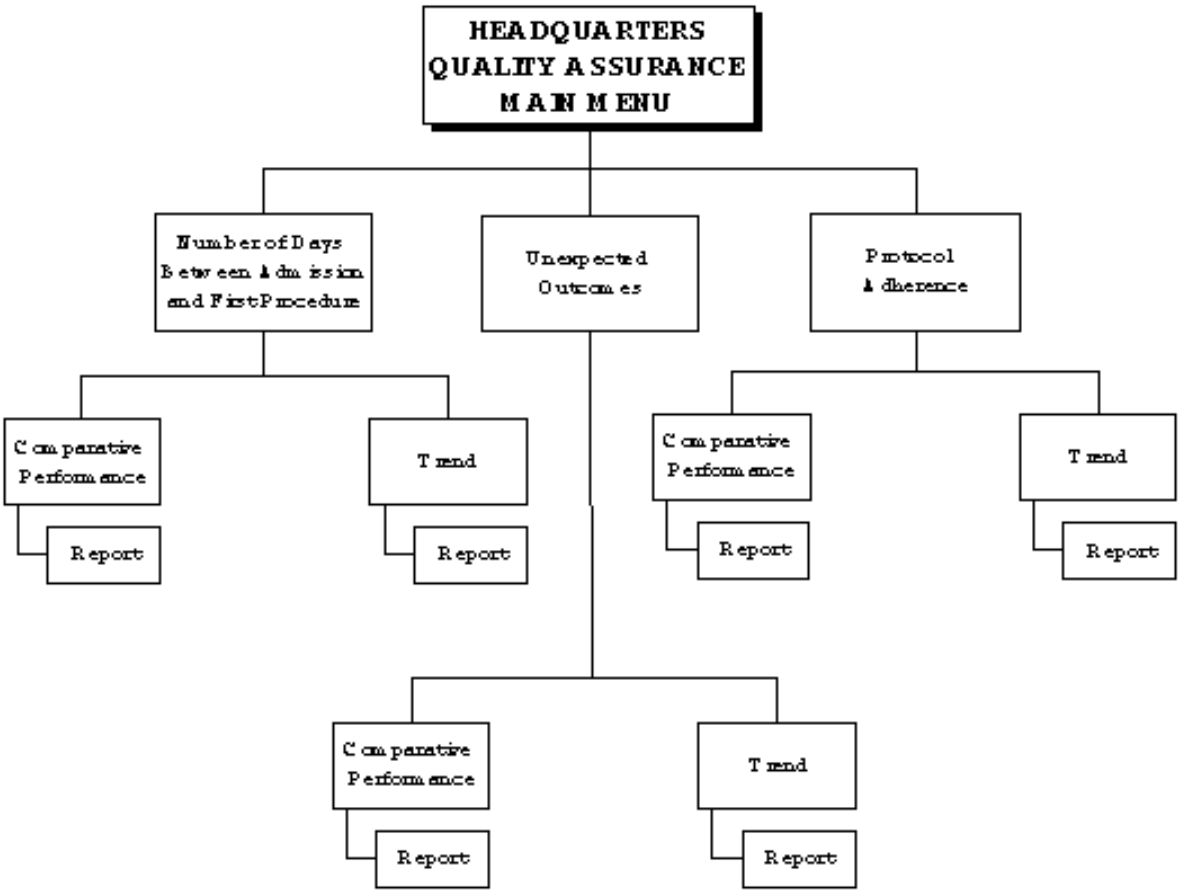
FD-1
POLYCLINIC AND HOSPITAL QUALITY ASSURANCE APPLICATIONS



FD-2
BRANCH QUALITY ASSURANCE APPLICATION



FD-3
HEADQUARTERS QUALITY ASSURANCE APPLICATION



APPENDIX D

REFERENCES

MEETING OF 31 MARCH, 1996

Location: HIO Headquarters

Subject: Review Quality Assurance Reports

Attendee	Title
Dr. Rawash El Deab	HIO Reengineering Implementation Coordinator

MEETING OF 1 APRIL, 1996

Location: Medinat Nasr Hospital

Subject: Hospital Quality Control Procedures

Attendee	Title
Dr. Farouk Abdallah	HIO Quality Assurance Consultant

MEETING OF 2 APRIL, 1996

Location: Project Office

Subject: Review Quality Assurance Reports

Attendee	Title
Ms. Nadwa Rafet	Component 1/URC Deputy Chief of Party
Mr. Hank Reinhard	Component 1/URC Chief of Party
Ms. Mediha Hassan	Component 1/URC MIS Specialist
Mr. Hussein Sidki	USAID
Ms. Leslie Graham	MAXIMUS/HIO Chief of Party
Mr. Hussam El Alfy	MAXIMUS/HIO Operations Manager

MEETING OF 3 APRIL, 1996

Location: Project Office

Subject: Review Quality Assurance Reports

Attendee	Title
Dr. Farouk Abdallah	HIO Quality Assurance Consultant

MEETING OF 6 APRIL, 1996

Location: Project Office

Subject: Review Quality Assurance Reports

Attendee	Title
Dr. Samr	HIO Statistician

MEETING OF 7 APRIL, 1996

Location: Project Office

Subject: Review Quality Assurance Statistics

Attendee	Title
Ali El Aroussi	HIO Statistical Manager
Hussam El Alfy	MAXIMUS/HIO Operations Manager

MEETING OF 8 APRIL, 1996

Location: Project Office

Subject: Review Quality Assurance Reports

Attendee	Title
Dr. Nabil El Mehairy	HIO Chairman
Dr. Rawash El Deab	HIO Reengineering Implementation Manager
Mr. Carl Abdou Rahmaan	USAID Project Officer
Mr. Hussein Sidki	USAID
Ms. Leslie Graham	MAXIMUS/HIO Chief of Party
Mr. Felix Meyer	MAXIMUS/HIO Reengineering Technical Adviser
Mr. Hussam El Alfy	MAXIMUS/HIO Operations Manager